

Lung nodule, tracheal stenoses and coronary disease: how to approach when are all associated to?

Nódulo de pulmão, estenose traqueal e doença coronariana: como abordar quando associadas?

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Abstract

A 67-year-old male patient underwent exploratory thoracotomy for pulmonary nodule resection. The patient presented a cardiorespiratory arrest during anesthesia due to myocardium infarction. After reanimation the patient was referred to ICU where he remained intubated for 7 days. Subsequently, he developed cervical tracheal stenosis. At first, the patient underwent a myocardium revascularization followed by surgical resection of tracheal stenosis through tracheoplasty.

Descriptors: Tracheal stenosis. Myocardial revascularization. Lung neoplasms. Hamartoma

Resumo

Paciente de 67 anos, sexo masculino, submetido à toracotomia exploradora para ressecção de nódulo pulmonar. Apresentou parada cardíaca durante o ato anestésico devido a infarto agudo do miocárdio. Após manobra de ressuscitação, foi encaminhado para a UTI, permanecendo intubado por 7 dias, evoluindo posteriormente com estenose traqueal cervical. Foram realizadas, posteriormente, revascularização do miocárdio e ressecção do nódulo pulmonar num primeiro tempo e, depois, correção cirúrgica da estenose traqueal por traqueoplastia.

Descritores: Estenose traqueal. Revascularização miocárdica. Neoplasias pulmonares. Hamartoma.

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INTRODUCTION

The purpose of surgical intervention for benign lung tumors (solitary pulmonary nodule) is to avoid missing potentially malignant lesions [1], especially in stages I and II, in which they are treatable [2].

Of the nearly 25 million people in the United States undergoing noncardiac surgery, approximately 8 million of these have major cardiac risk factors or are older than 65 years. Based on these evidences, therefore, it is not surprising that cardiac complications occur when these patients are submitted to stress during the 3- to 4-day postoperative period. The cardiac morbidity rate is estimated to vary between 1% and 10%, depending on the patient and the type of surgical procedure performed [3].

The aim of the present study is to report the risks and complications of cardiorespiratory arrest in a patient undergoing noncardiac surgery for resection management of a pulmonary nodule.

CASE REPORT

On June 29, 2004, a 67-year-old male patient was referred to Hospital de Oncologia for a pulmonary nodule surgical resection. During anesthetic induction, the patient had cardiorespiratory arrest following acute myocardial infarction, besides an occipital stroke. After cardiorespiratory resuscitation maneuver, the patient required orotracheal intubation remaining in the ICU for 7 days. He was discharged after 30 days after hospital admission. Thirty-five days after hospital discharge, the patient developed a clinical picture of dyspnea and tracheal stridor.

A chest and anterior cervical region computerized tomography scans were performed, revealing tracheal stenosis in the cervical part of trachea (Figure 1).

On Set 1, 2004, the patient underwent bronchoscopy and emergency tracheal dilation with Montgomery® T-tube implant. The patient was hospitalized for 5 days and was discharged with medical follow-up.

On May 9, 2005, a transthoracic puncture was performed, but it was not possible to establish a diagnosis. On Jul 8, 2005, a dobutamine stress ECG was performed has a positive result for ischemia, and on Aug 9, 2005, a cardiac catheterization was performed with a consistent result of obstruction as follows: 70% in the anterior interventricular branch and 80% in the circumflex branch of left coronary artery; and 80% in right coronary artery.

On Aug 19, 2005, the patient underwent a myocardial revascularization surgery, being performed an anastomosis between the internal thoracic artery to the anterior interventricular branch and grafting a section of saphenous vein to the posterior left ventricular branch. At the same operation, a pulmonary nodule surgical resection in the

right lung (Figure 2) and a frozen biopsy, which was compatible with a benign tumor (hamartoma), were performed.

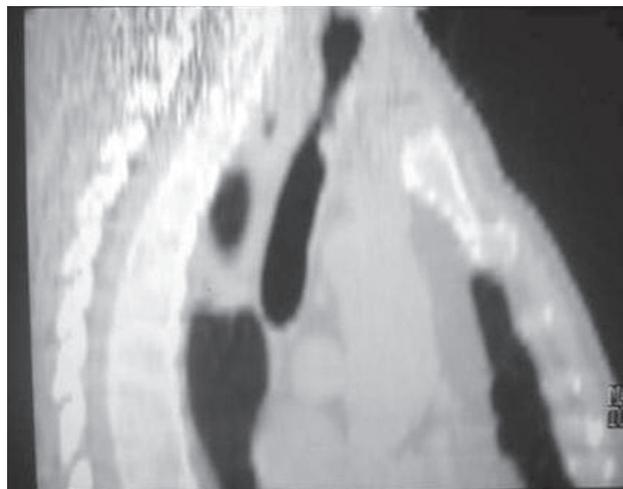


Fig. 1 – Chest Computerized Tomography showing an important tracheal stenosis (arrow)

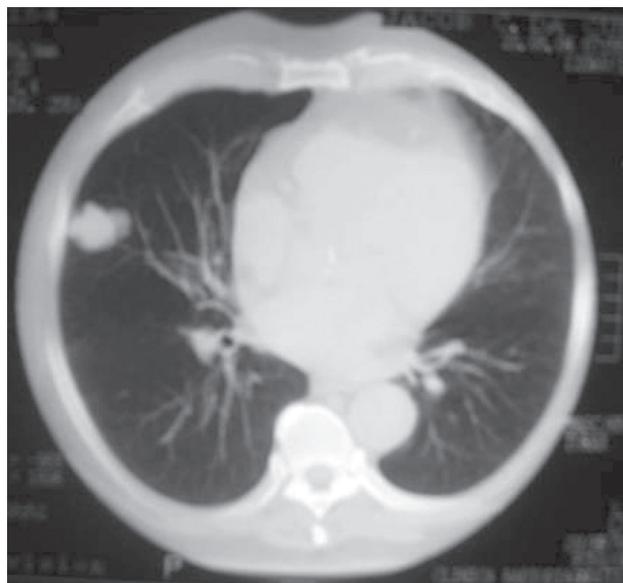


Fig. 2 – Benign tumor tomography imaging of inferior lobe of right lung

The patient had sternal suture dehiscence without postoperative mediastinitis and was released from hospital without any other complications.

After ambulatory evaluation and postoperative recovery, on Dec 12, 2005, it was decided to perform a cervicothoracic tracheoplasty with collar incision, partial exposure of the sternum, and maintenance of the Montgomery® T-tube.

The patient was released from hospital in a good local and health condition. Regular medical follow-up and

periodic control examination were performed. Montgomery® T-tube was withdrawal on Mar 7, 2007. The tube was removed on day 30 postoperatively and a granuloma resection was performed bronchoscopically in the suture line.

The patient recovered uneventfully and control bronchoscopy showed a pervious (permeable) tracheal lumen without granulomas.

DISCUSSION

Solitary pulmonary nodules are found at a rate of 1-2 per 1000 chest radiographs. About 30% of these nodules prove to be malignant. Of the rest of the nodules, benign tumors of the lung make up about 2-5% of primary lung tumors. Benign lung tumors are a heterogenous group of neoplastic lesions originating from pulmonary structures. These tumors include bronchial adenomas, hamartomas, among others [1].

The tragedy of lung cancer is associated with its delayed presentation and diagnosis. Signs and symptoms are rarely present until the malignancy has become advanced and possibly unresectable. Patients with the best prognosis are those found to have stage IA (T1N0M0) disease. These patients have a 61 to 75% 5-year survival following surgical resection [4].

Generally speaking, to perform the surgical procedure, induction of general anesthesia is achieved with intravenous anesthetics. Once a state of unconsciousness is achieved, anesthesia is maintained with inhaled and intravenous anesthetics with or without muscle relaxants. Although each of these drugs has unique properties, one can say in general terms that the inhaled anesthetic agents reduce arterial blood pressure by decreasing systemic vascular resistance, myocardial contractility, and stroke volume. However, myocardial ischemia may develop in patients with coronary artery disease [3]. Patients with a history of congestive heart failure and impaired myocardial contractility are particularly sensitive to drug-induced myocardial depression.

The abovementioned patient had undetermined pulmonary nodule. He underwent thoracotomy for pulmonary nodule resection. Although previous heart evaluation may have allowed the procedure, the patient had an acute myocardial infarction and cardiac arrest during the surgery.

It is known that out of 1000 patients who underwent tracheal intubation, one develops tracheal stenosis [7]. This patient, owing to an event of anesthesia complication, remained intubated for 7 days, and, subsequently, he developed tracheal stenosis.

A patient can present with concomitant lesions of the heart and lung. Although uncommon, when present they pose a therapeutic challenge for surgeons.

The majority of the patients with concomitant lesions first present with cardiac disease. An asymptomatic lung cancer is found on routine preoperative chest radiograph. Less frequently, patients with lung cancer present a significant cardiac disease that otherwise untreated can increase the perioperative morbidity and mortality of patients underwent lung carcinoma resection [5].

Surgeons may be reluctant to perform simultaneous pulmonary resection and cardiac surgery [5]. However, in doing so, they avoid to perform two aggressive procedures in the same patient. Besides, to perform a cardiac surgery first and after a while the pulmonary resection, as it was classically performed before, increase the morbidity and mortality rates of the pulmonary resection by the delay on the procedure performance [6].

Our patient presented, besides the concomitant lesions, tracheal stenosis. These three events, all together, were not found in the literature. We have chosen to perform the myocardial revascularization with CPB prior to heparinization and lung resection. Three months after the patient's recovery, a tracheal stenosis repair through conventional tracheoplasty was performed. Due to the extension of the lesion, we have chosen for the maintenance of the Montgomery® T-tube, which has been further withdrawn.

REFERENCES

1. Perez N, Adediji O. Benign lung tumors. *eMedicine Specialties/ Thoracic Surgery* January 31, 2005.
2. Sharma S, Navaratnam S. Solitary pulmonary nodule. *eMedicine Specialties/ Thoracic Surgery*. February 16, 2004.
3. Potyk D, Raudaskoski P. Preoperative cardiac evaluation for elective noncardiac surgery. *Arch Fam Med*. 1998;7(2):164-73.
4. Saueressig MG, Macedo Neto AV, Moreschi AH, Xavier RG, Sanches PRS. A correção das estenoses traqueobrônquicas mediante o emprego de órteses. *J Pneumol*. 2002;28(2):84-93.
5. Tan BB, Flaherty KR, Kazerooni EA, Iannettoni MD; American College of Chest Physicians. The solitary pulmonary nodule. *Chest*. 2003;123(1 Suppl):89S-96S.
6. Rao V, Todd TR, Weisel RD, Komeda M, Cohen G, Ikonomidis JS, et al. Results of combined pulmonary resection and cardiac operation. *Ann Thorac Surg*. 1996;62(2):342-7.
7. Danton MH, Anikin VA, McManus KG, McGuigan JA, Campalani G. Simultaneous cardiac surgery with pulmonary resection: presentation of series and review of literature. *Eur J Cardiothorac Surg*. 1998;13(6):667-72.